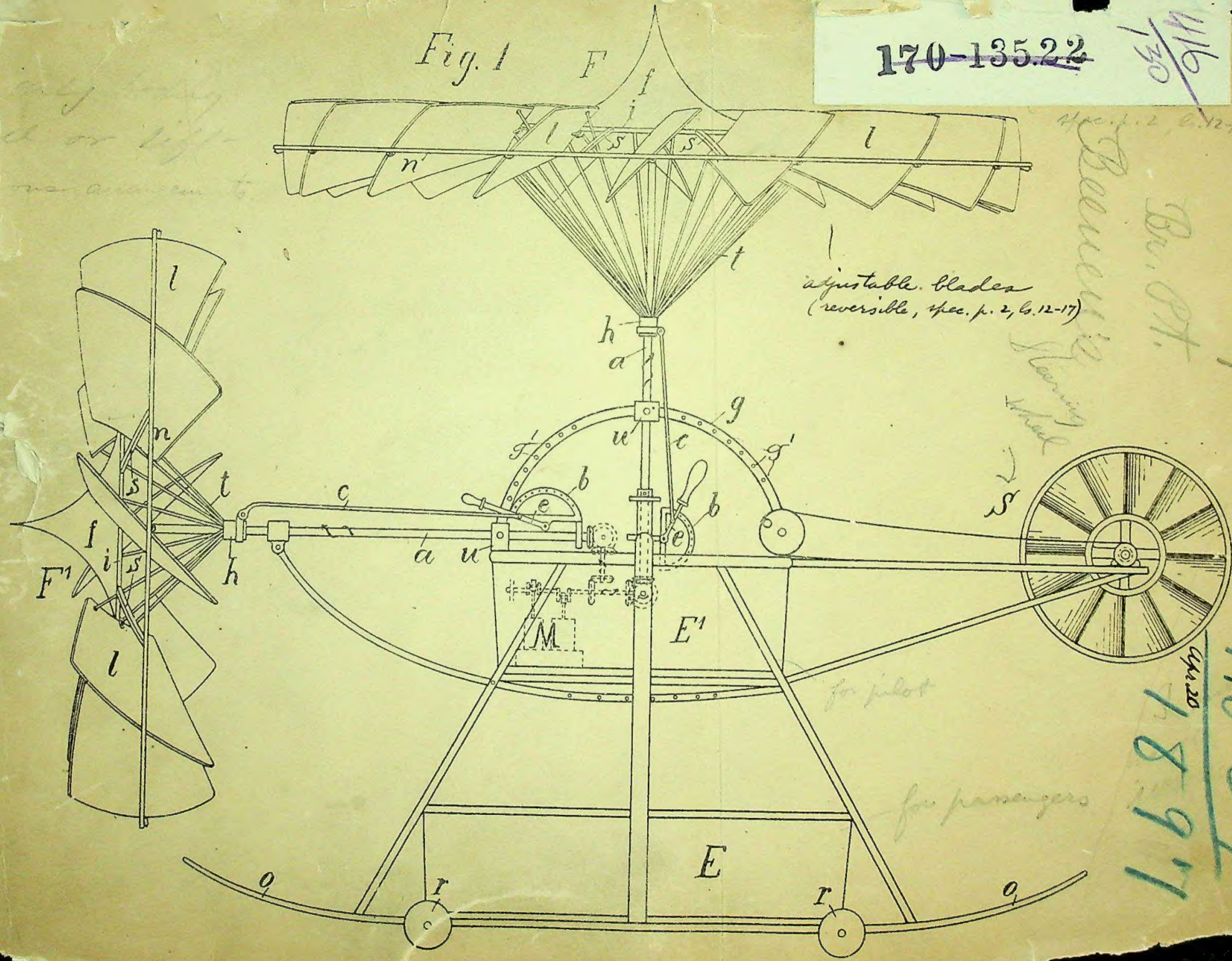
Fig. 1



adjustable blades
(reversible, spec. p. 2, l. 12-17)

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COMPLETE SPECIFICATION.

Improvements in Flying Machines.

I, Bernhard Reinhard Beenen of Moritzstrasse, Dresden, Germany, Doctor of Medicine, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a flying machine in which wing or sail wheels serving for the propulsion of the machine are each provided with a central hollow conical part and with outwardly concaved sector shaped wings capable of being turned and adjusted in the plane of rotation of the wheel. The central conical part is designed on the one hand to guide laterally against the wings the air displaced and therefore compressed by it, thus causing said wings to operate with greater effect and on the other hand when the machine is being lowered to take in air and in conjunction with the sector shaped wings around it adjusted in the plane of rotation, to the closed position, form a parachute affording great resistance to falling by gravity. The wings of the propelling wheels may be reversed through a corresponding rod so that the direction of flight may be reversed without reversing or changing the working of the driving engine. The propelling wheels can with their axes be so adjusted by means of an adjusting mechanism that the vertical wheel ordinarily serving only for horizontal propulsion of the machine may be drawn into a horizontal position for raising the machine, and to form when required, a parachute for descending, and the horizontal wheel ordinarily serving only for vertical propulsion may be drawn into a vertical position for the purpose of horizontal propulsion. The bottom of the car is provided with wheels *r* and with sledge like runners *o* to facilitate the movement of the machine upon the ground when the ascent is being made and to lessen the shock when descending on the ground.

In the accompanying drawings

Fig. 1 is an elevation of the flying machine of this invention.

Figs. 2 and 3 respectively an elevation and half plan of a wing wheel having some of its wings closed and some open.

Fig. 4 is a detail sectional view of a wing.

A is the car of the machine constructed in two stages E, E^1, connected together in any suitable way, the upper stage being for the accommodation of the motor M by which the machine is driven, and for the other working parts and adjusting mechanisms, and for the driver, the lower stage serving for the reception of passengers or attendants. F, F^1 are the wing wheels driven from the motor M simultaneously, through spindles and toothed gearing as shewn, or through other suitable means. The wheels are practically alike in construction only the one used for ascending is the larger and is furnished with a correspondingly larger number of wings than the side wheel for horizontal propulsion. Each wheel is fixed on a spindle *a* driven from the motor, as shewn, and with the wings closed presents the form of a large parachute with a middle conical projecting part *f* which may be several yards in diameter and at its outer edge terminates in a ring *i*. This latter is in connection through rods *s* with an outer ring *n* and between said rings are carried the adjustable wings *l* which are bulged out or concave, the convexity being preferably at their upper or outward surface as shewn on an enlarged scale in Fig. 4.

[*Price* 8*d*.]

The wings *l* are mounted to turn on pivots *z* and are in connection through rods *t* with a sleeve *h* slidable on the corresponding spindle *a*, said sleeve being in connection through a rod *c* with a hand lever *e* fitted to turn and be adjustable on the frame *b* for the purpose, when operated, of opening or closing the wings or setting them at any desired angle.

When it is intended to undertake a journey or flight with the machine, both wheels having their wings provisionally closed, that is, placed in the plane of rotation are set in rapid rotation from the motor. The wings of wheel F are then from the corresponding hand lever *e* slowly opened say to an angle of 45° (Figs. 1, 2, 3 right hand side). This causes the machine to ascend as the wheel acts as a wind screw. When the desired height has been reached, the angle at which the wings are set is reduced so much as will keep the machine at the desired height. The wings of wheel F^1 are now opened forwardly to commence the forward flight, to reduce or stop which, or even to change it for a backward flight, it is only necessary to set from the corresponding lever *e* the wings back, towards or into the closed position, or to open them backwardly, thus accomplishing ascent, descent and forward and backward movement without changing the direction in which the motor works.

g is a semicircular frame on which the wheel spindles *a* and consequently the wheels may be adjusted and fixed by bolting or screwing up the spindle collars *u* through holes g^1 in the frame, thus wheel F may be turned downward and fixed on either side whilst wheel F^1 may be turned upwards and fixed in this changed position, the object being in the case of a rapid horizontal flight, which is attained by reason of the great power of the wheel F and the slight resistance of the whole machine to the air, to give a slightly forward position to the larger wheel F in order to maintain equilibrium. In the event of the larger wheel becoming defective it may be set back and the smaller wheel F^1 raised for provisionally replacing it and thus guard against accidents.

Further, both wheels may be adjusted, the larger somewhat to the rear and the smaller upwardly, to operate the ascent from the ground with united force. Also if during a journey, the motor should get out of order suddenly, the wing wheels may each be made to serve as parachutes by setting their wings in the horizontal plane.

S is the steering wheel of the machine.

Instead of only one wheel F for vertical flight or ascent several of such wheels may be employed placed adjacent to one another the car being in this case correspondingly lengthened.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is :—

1. A flying machine in which the propelling wing or sail wheels are with their spindles or axles so adjustable by means of suitable mechanism that the wheel ordinarily serving only for horizontal flight may be adapted for vertical flight or ascent and the wheel ordinarily serving only for vertical flight may be adapted for horizontal flight, substantially as described and shewn.

2. In the flying machine referred to, the wing or sail wheels each provided with a central hollow conical cap and concave sector shaped wings, said central cap having for object, on the one hand, to guide the air, divided and compressed by it, laterally into the wings and thereby cause a more efficacious action of the same, and on the other hand when the machine is descending to take in air and form a parachute whilst the sector shaped wings owing to their adjustability in the plane of rotation of the wheel serve to form a closed ring around the conical cap, and therewith a closed whole, which forms a great enlargement of the parachute, substantially as described and shewn.

3. A flying machine of the kind referred to in which the car is furnished with sledge like runners for the purpose of obtaining in the ascent an easy forward travel

of the machine over the ground, and in the descent a lessening of the shock when coming on to the ground, substantially as described and shewn.

Dated this 20th day of April 1897.

THOMAS R. SHILLITO,
89 Chancery Lane, London, W.C., Agent for the Applicant.

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